--13. A process as claimed in claim 1, wherein the condensing agent borontrifluoride is used in a gaseous form.--

--14. A process as claimed in claim 1, wherein 4.5 moles of borontrifluoride is used with respect to each mole of 7-aminocephalosporanic acid.--

--15. A process as claimed in claim 3, wherein the base comprises ammonium hydroxide.--

REMARKS

Claims 1-15 are pending. By this Amendment, claims 1-11 are amended to address formal issues and claims 12-15 are added to ensure specific claim coverage for "preferred" limitations deleted from claims 7-10.

The attached Appendix includes marked-up copies of each rewritten paragraph (37 C.F.R. §1.121(b)(1)(iii)) and claim (37 C.F.R. §1.121(c)(1)(ii)).

In the Office Action, claims 2-11 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Six specific issues were identified in the Office Action. All of the claims have been amended to address the issues identified in the Office Action, as well as similar issues that were not identified in the Office Action but that could lead to a similar rejection. It is respectfully submitted that all of the amendments have been presented to overcome the §112, second paragraph, rejection without narrowing of the claims, and that claims 1-15 are now in compliance with 35 U.S.C. §112, second paragraph. Thus, reconsideration and withdrawal of the rejection are respectfully requested. Prompt issuance of a Notice of Allowance directed to claims 1-15 is further respectfully requested.

Should the Examiner have any questions or comments concerning the above amendments or any other aspect of this patent application, he is respectfully invited to telephone the undersigned at the number set forth below.

Respectfully submitted,

James A. Oliff
Registration No. 27,075

William P. Berridge
Registration No. 30,024

Attachment:
Appendix

Date: December 2, 2002

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

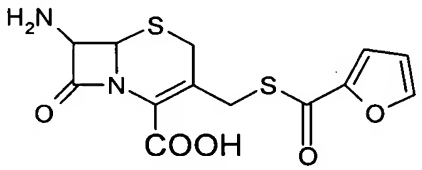
DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
Charge any fee due to our Deposit Account No. 15-0461

APPENDIX

Changes to Specification:

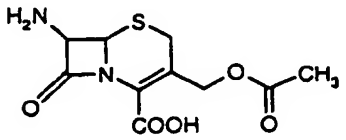
Page 1, first paragraph, please replace:

The present invention discloses an improved process for the preparation of 7-amino-3 -[2-(furylcarbonyl) thiomethyl]-3-cephem-4-carboxylic acid represented by formula (I)

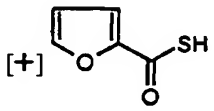


(I)

by the condensation of 7-amino cephalosporanic acid (7-ACA) represented by formula (II) with furyl-2-carbonylthiol represented by formula (III) using borontrifluoride as condensing agent.



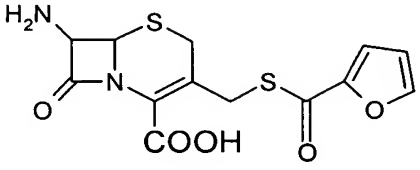
(II)



(III)

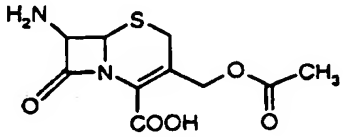
Page 4, first paragraph, please replace:

The present invention provides a process for the preparation of 3-[2-(furylcarbonyl) thiomethyl]-3-cephem-4-carboxylic acid represented by formula (I),

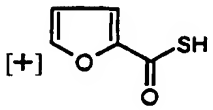


(I)

the said process comprising the steps of condensing 7-aminocephalosporanic acid (II) with furyl-2-carbonylthiol (III) in the presence of borontrifluoride at 20°-50°C in an organic solvent and isolating the compound of formula (I).



(II)



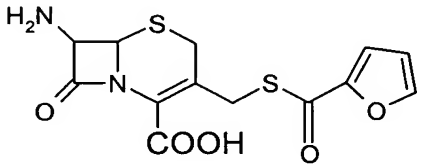
(III)

Changes to Claims:

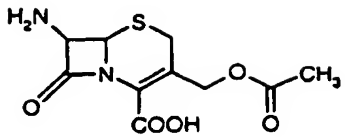
Claims 12-15 are added.

The following is a marked-up version of the amended claim(s):

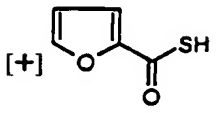
1. (Amended) A process for preparation of 3-[2-(furylcarbonyl) thiomethyl]-3-cephem-4-carboxylic acid represented by formula (I),



(I)



(II)



(III)

the said process comprising the steps of condensing 7-aminocephalosporanic acid (II) with furyl-2-carbonylthiol (III) in the presence of borontrifluoride at 20-50°C in an organic solvent and isolating the compound of formula (I)

2. (Amended) A process as claimed in claim 1, wherein the ~~condensation reaction~~condensing step is performed at a temperature range of 30°-35°C.

3. (Amended) A process as claimed in claim 1, wherein the reaction mixture of the ~~condensation~~condensing step is poured into ice cold water, adjusting the pH of the solution to 3-4 with a base to precipitate the solid.

4. (Amended) A process as claimed in claim 3, wherein the pH of the solution ~~lies~~/is in the range of 3.45-3.55.

5. (Amended) A process as claimed in claim ~~2~~3, wherein the solid obtained by precipitation is washed with a mixture of water and organic solvent, drying the solid at a temperature range of 40°-45°C under vacuum.

6. (Amended) A process as claimed in claim 1, wherein furyl-2-carbonylthiol of formula (III) ~~without isolating~~ is used ~~as its~~in the form of a solution in which said furyl-2-carbonylthiol was prepared, said solution comprising an organic solvent selected from a group consisting of ethylacetate, methyl acetate, propyl acetate, dichloromethane, toluene, diethyl ether, di-isopropyl ether and/~~or~~ mixtures thereof.

7. (Amended) A process as claimed in claim 1, wherein the organic solvent used in the ~~condensation reaction~~condensing step is selected from a group consisting of ethylacetate, methyl acetate, propyl acetate, dichloromethane, toluene, diethyl ether, di-isopropyl ether, acetonitrile, acetic acid ~~or~~and mixtures thereof~~, most preferably ethyl acetate~~.

8. (Amended) A process as claimed in claim 1, wherein the condensing agent borontrifluoride is used in a gaseous form or its solution in an organic solvent selected from ethyl acetate, acetonitrile, methyl acetate, propyl acetate, dichloromethane, toluene, diethyl ether, di-isopropyl ether and/~~or~~ mixtures thereof~~, most preferably in gaseous form~~.

9. (Amended) A process as claimed in claim 1, wherein 3-8 moles of borontrifluoride is used with respect to 7-aminocephalosporanic acid~~, the preferred molar ratio being 4.5:1~~.

10. (Amended) A process as claimed in claim 3, wherein the base ~~used~~ is selected from a group consisting of ammonium hydroxide, sodium hydroxide, or sodium carbonate~~and most preferably ammonium hydroxide~~.

11. (Amended) A process as claimed in claim 5, wherein the organic solvent used for washing the final product ~~is~~comprises at least one member selected from a group consisting of acetonitrile, ethylacetate, acetone, methyl acetate, propyl acetate, dichloromethane, toluene, diethyl ether, di-isopropyl ether and/~~or~~ mixtures thereof.